

# Los Gatos Creek Trail Reach 4 Riparian Mitigation Year 1 (2008) Monitoring Report



**Biotic Resources Group**

Biotic Assessments ♦ Resource Management ♦ Permitting



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## Los Gatos Creek Trail Reach 4 Riparian Mitigation Year 1 (2008) Monitoring Report

*Prepared for:*

City of San Jose  
Department of Public Works, City Facilities Architectural Services

and

David Powers & Associates

*Prepared by:*

Biotic Resources Group  
Kathleen Lyons, Plant Ecologist

December 2, 2008





# **LOS GATOS CREEK TRAIL, REACH 4 RIPARIAN MITIGATION SITES**

## **YEAR 1 (2008) MONITORING REPORT**

### **INTRODUCTION**

The Los Gatos Creek Trail Riparian Mitigation occurs on two sites. Mitigation Site 1 is located upstream of Meridian Avenue (11,500 square feet); Mitigation Site 2 is located downstream of Auzerais Avenue (10,400 square feet). The location of these sites is depicted on Figure 1.

The development of the Reach 4 trail was designed to minimize impacts to the riparian resources associated with Los Gatos Creek; however, a small amount of riparian vegetation was removed (6,658 square feet of riparian woodland and 34 linear feet of shaded riverine aquatic habitat). These actions were outlined in the project's environmental documents (*Los Gatos Creek Trail, Reach 4: Coe Avenue to Auzerais Avenue Initial Study and Mitigated Negative Declaration*, City of San Jose, June 2004). Due to impacts to these sensitive resources, the City developed specific environmental mitigation measures for the project. These measures include riparian habitat replacement and long-term maintenance at two riparian mitigation areas. Specific mitigation actions required for the areas are addressed in the *Final Los Gatos Creek Reach 4 Trail Extension Riparian/SRA Habitat Mitigation and Monitoring Plan*, H.T. Harvey & Associates, 2004) and as amended in the *Plans and Specifications for Los Gatos Creek Trail Reach 4: Lincoln Avenue to Auzerais Avenue*, City of San Jose, September 2005). In addition, the *Los Gatos Creek Trail Reach 4 Riparian Mitigation Maintenance Manual* (Biotic Resources Group, 2005) was prepared for the sites. This manual outlines maintenance activities to be implemented by the City of San Jose during Years 2-5.

Regulatory agency permits for the project required implementation of the riparian revegetation. Pursuant to these plans and permit conditions, the Year 1 (2008) condition of the revegetation efforts, including plant survival, were monitored. The results of the Year 1 (2008) revegetation action and monitoring results are described in this report.

### **SUMMARY OF PROJECT PERMITS AND REQUIREMENTS BY AGENCY**

The project's revegetation requirements are derived from the City of San Jose's and other regulatory agencies permit conditions and the need to create self-sustaining natural habitats within the projects 5-year reporting schedule.

#### **California Department of Fish and Game Agreement (CDFG)**

The riparian habitats within the project area are under the jurisdiction of the California Department of Fish and Game (CDFG) under 1602 of the California Fish and Game Code. The trail construction project resulted in the removal of 6,658 square feet of riparian woodland and 34 linear feet of shaded riverine aquatic habitat. To mitigate these impacts, the Riparian Mitigation and Monitoring Plan outlines a 3:1 replacement ratio for native riparian woodland impacts, a 1:1 replacement ratio for non-native riparian; 0.5:1 ratio for grassland and 3:1 ratio for SRA. Using the site upstream of Meridian Avenue (Mitigation Site #1) and the Auzerais Avenue site (Mitigation Site #2), a total of 0.5 acre of riparian mitigation is required (including 125 linear feet of SRA).

## City of San Jose Environmental Impact Report

As per the environmental documents for the project, the *riparian mitigation sites* must be established and meet performance criteria by the end of Years 1-5, Year 7, and Year 10. Yearly monitoring reports are to be prepared by the City by December 31 of Years 1-5, Year 7, and Year 10.

### Summary of Mitigation Actions and Monitoring Requirements

The mitigation plan requires the following actions:

1. Establish two *riparian mitigation sites* along Los Gatos Creek.
2. Utilize plant materials collected from the Los Gatos Creek watershed.
3. Utilize supplemental irrigation during the plant establishment period (i.e., first 3 years).
4. Implement periodic weed control to benefit the mitigation planting areas.
5. Maintain a minimum 80% survival rate of all trees and shrubs during the first five years, replacing dead plants if survival rates fall below this performance standard.
6. Monitor percent cover along two transects per site to document the progress of the riparian mitigation.
7. Document the progress of the revegetation over a five-year period, with annual reports submitted to California Department of Fish and Game and City of San Jose Planning Department.
8. Document progress of revegetation at Years 7 and 10, with reports of findings submitted to the City of San Jose Planning Department.

The monitoring program for the two *riparian mitigation sites* is designed to ensure project compliance with applicable regulatory permits and conditions. This will be accomplished by initiating a 3-year plant establishment maintenance program such that plant survival rates are maximized and desired habitat features are achieved. The program also includes implementation of a 2-year post-establishment period maintenance program, which also maximizes the potential for long-term plant survival and habitat features. The revegetation maintenance program includes the implementation of remedial actions on a yearly basis if plantings fail to meet performance standards. The success of the maintenance and management program are to be documented by implementing the monitoring program that documents the status of the *riparian mitigation sites* and reports the findings to regulatory agencies.

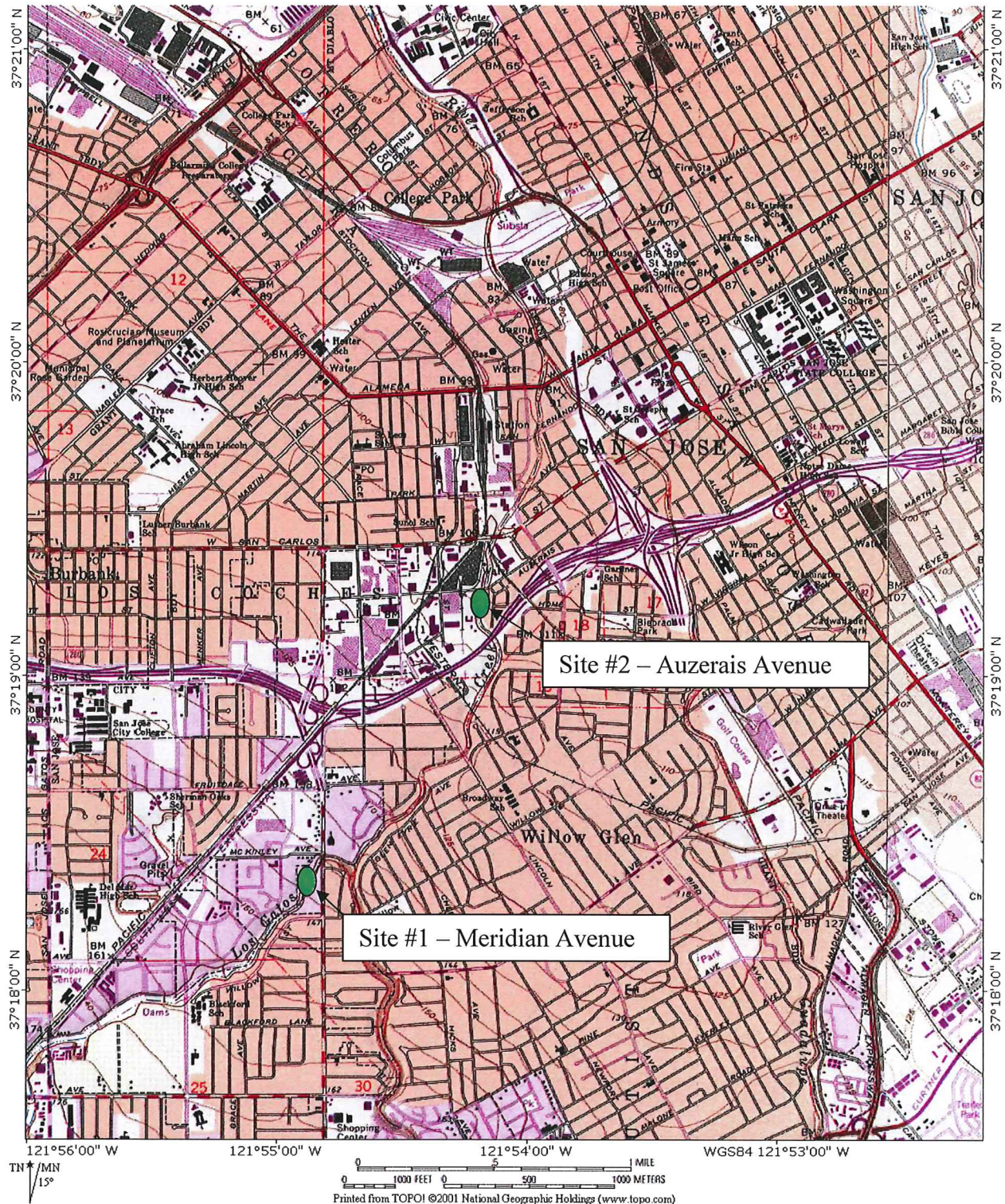
### REVEGETATION ACTIVITIES IMPLEMENTED TO DATE

In fall/winter 2007, native riparian plantings were installed within the designated *riparian mitigation sites* by Central Coast Wilds, a landscape contractor. The as-built plan for Site #1 (Meridian Avenue) is depicted in Figure 2. The as-built plan for Site #2 (Auzerais Avenue) is depicted in Figure 3.

A total of 169 plants were installed within the two areas. A list of the plants installed is presented in Table 1. All plants were protected with above and belowground browse protection and were mulched. Mitigation site #1 is irrigated using gel packs; mitigation site #2 is hand-watered.

Central Coast Wilds implemented revegetation site maintenance from January through October 2008. Their activities include weed control, periodic supplemental irrigation, trash and debris clean-up, and removal/control of invasive, non-native plant species. As of November 1, 2008 the City of San Jose is responsible for maintenance of the two revegetation areas.





### Biotic Resources Group

2551 S. Rodeo Gulch Road #12 ♦ Soquel, CA 95073  
(831) 476-4803 ♦ Fax (831) 476-8038

Los Gatos Creek Trail Reach 4  
Riparian Mitigation Sites  
Project Location

Figure 1  
12/08  
467-03





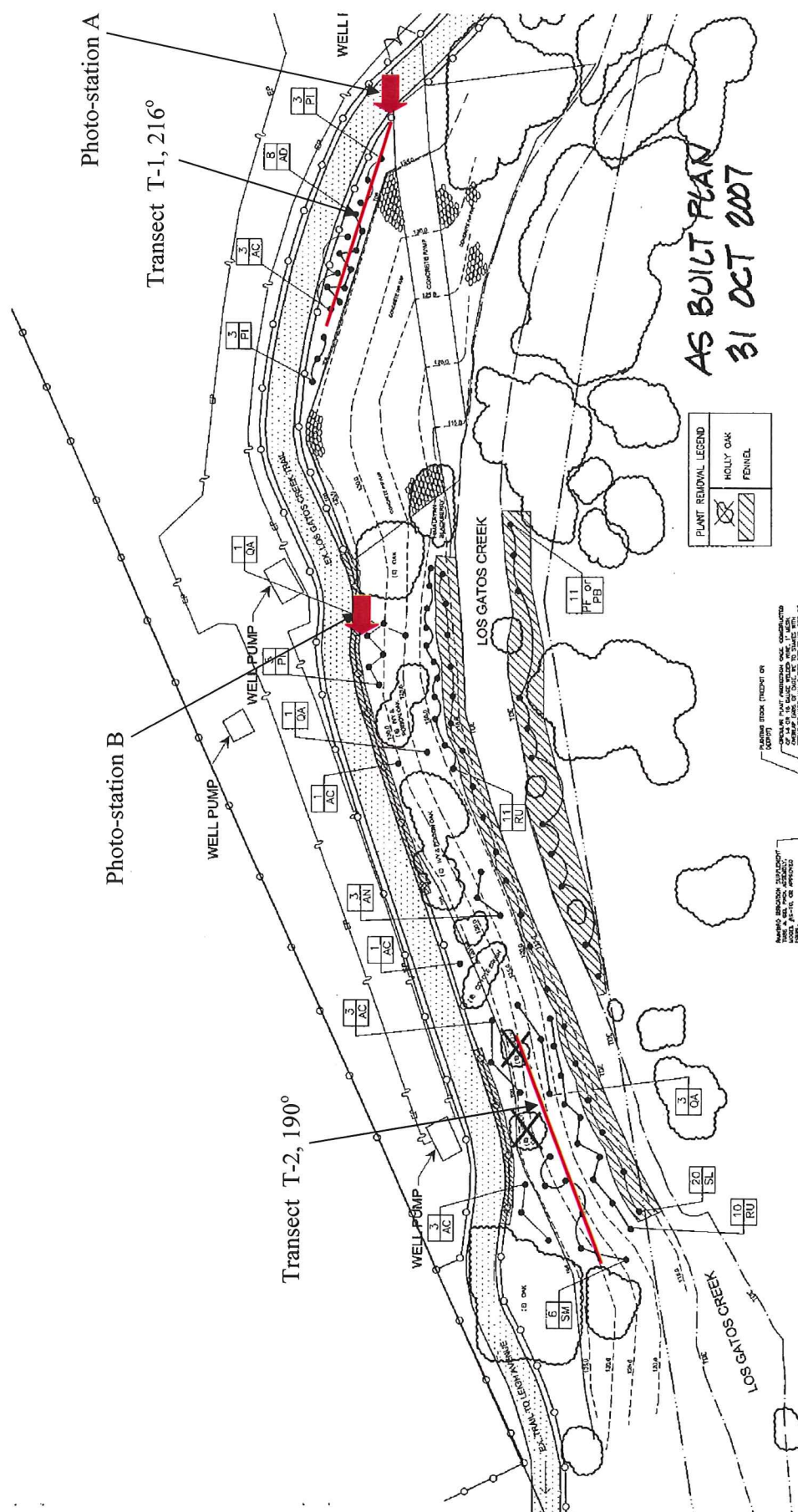


Figure 2  
12/08  
467-03

## Los Gatos Creek Trail, Reach 4 Riparian Mitigation

## Site #1 – Meridian Avenue

## Biotic Resources Group

2551 S. Rodeo Gulch Road #12 ♦ Soquel, CA 95073  
(831) 476-4803 ♦ Fax (831) 476-8038









**Table 1. Plant Installation Specifications within Riparian Mitigation Sites**

Scientific Name	Common Name	Spacing (feet)	Container Size	Number of plants Installed
<b>Mitigation Site #1 (Meridian Avenue)</b>				
<i>Acer negundo</i>	Box elder	14	5-gallon	3
<i>Aesculus californica</i>	California buckeye	14	Tree pot	11
<i>Artemisia douglasiana</i>	Mugwort	5	Deepot	8
<i>Populus fremontii</i>	Fremont cottonwood	18	Cutting	11
<i>Prunus illicifolia</i>	Holly-leaved cherry	8	Tree pot	11
<i>Quercus agrifolia</i>	Coast live oak	16	Tree pot	5
<i>Rubus ursinus</i>	California Blackberry	8	Deepot	21
<i>Salix laevigata</i> <i>S. lasiolepis</i>	Red willow or arroyo willow	10	Cutting	20
<i>Sambucus mexicana</i>	Blue elderberry	14	Tree pot	6
	<b>Site 1 Total</b>			<b>96</b>
<b>Mitigation Site #2 (Auzerais Avenue)</b>				
<i>Acer negundo</i>	Box elder	14	5-gallon	7
<i>Aesculus californica</i>	California buckeye	14	Tree pot	9
<i>Baccharis pilularis</i>	Coyote brush	10	Deepot	13
<i>Prunus illicifolia</i>	Holly-leaved cherry	8	Tree pot	11
<i>Quercus agrifolia</i>	Coast live oak	16	Tree pot	19
<i>Sambucus mexicana</i>	Blue elderberry	14	Tree pot	14
	<b>Site 2 Total</b>			<b>73</b>

Source: City of San Jose, Project Plans and Specifications, 2005

## MONITORING RESULTS

### Methodology

The two riparian mitigation sites were monitored quarterly during 2008 (January 15, April 16, July 10, and October 8). Kathleen Lyons of the Biotic Resources Group conducted the monitoring. At each quarterly inspection session, environmental features of the planted areas were noted (i.e., human disturbances) as well as plant species performance. The riparian revegetation areas were also evaluated for site maintenance and possible disturbances.

A detailed monitoring session was conducted on October 8 and 15 to document plant survival, health and vigor (i.e., presence of chlorosis, limb dieback, drought stress) and record plant cover. The rating system used for plant health and vigor is listed on Table 2.

**Table 2. Plant Health and Vigor Rating System**

Code	Rating	Health Characteristics	Vigor Characteristics
4	Excellent	75-100% healthy foliage	Vigorous new growth observed throughout plant
3	Good	50-74% healthy foliage	Vigorous new growth observed only at terminal bud
2	Fair	25-49% healthy foliage	No new growth evident
1	Poor	0-24% healthy foliage	Stem dieback observed

The monitoring also included documenting plant species composition and plant cover along permanent transects. Two point-intercept transects were established within each mitigation site, collectively measuring 115 meters. Data was collected at 1-meter intervals along the transects. Monitoring data was

compared to the Year 1 performance standards. Table 3 lists the performance standards for the two *riparian mitigation sites*. In Year 1 performance standards are specified for plant survival (container stock trees and shrubs), weed control, and the maximum cover provided by invasive, non-native plant species. Performance standards for tree height and plant cover begin in Year 3.

**Table 3. Yearly Performance Standards, Years 1-5 (2008-2012)**

Species	Tree Height (feet)		Plant Cover (%)					Plant Survival Per Species (container stock) Years 1-5	Weed Control Years 1-5
	Yr3 2010	Yr 5 2012	Yr 1 2008	Yr 2 2009	Yr 3 2010	Yr 4 2011	Yr 5 2012		
<b>Trees and Shrubs – Mitigation Site #1 (Meridian Avenue)</b>			-	-	15%	-	30%	80%	<6" (basins)
<b>Trees and Shrubs – Mitigation Site #2 (Auzerais Avenue)</b>				-	10%	-	20%	80%	<6" (basins)
<b>Invasive Plant Species</b>			≤5%	≤5%	≤5%	≤5%	≤5%		
<b>Trees and Shrubs</b>									
Blue elderberry	6	8	Source: Mitigation and Monitoring Plan, H.T. Harvey & Associates, 2004						
California buckeye	4	5							
Box elder	6	8							
Fremont or black cottonwood	7	9							
Coast live oak	5	6							
Willow	7	9							

## Results

The monitoring documented plant survival as well as environmental features within the two *riparian mitigation sites*. Human disturbances were minimal at both sites. The mulch at each planting basin was in good condition throughout the year and, as a result, weeds were minimal within the planting basins.

**Supplemental Irrigation.** The use of gel packs for supplemental irrigation at site #1 (Meridian Avenue) appeared adequate for plant growth and most plants exhibited good to excellent plant survival rates and high values for plant health and vigor. As per project plans and specifications the gel packs were checked once a month, with the gel packs re-activated (soaked in water for 10 minutes) and re-inserted in the holder tubes. At site #2 (Auzerais Avenue) the plantings were hand-watered from an installed quick coupler. According to the plans and specifications for this site the plants were watered weekly.

**Invasive, Non-native Plant Species.** Infestations of invasive, non-native plants were adequately reduced at both sites. Site #1 had pre-existing stands of English ivy (*Hedera helix*), fennel (*Foeniculum vulgare*), and holly oak (*Quercus ilex*) which were removed/treated prior to planting. Re-emergence of these plants within the mitigation area were adequately controlled during 2008, although ivy plants still occur on the steep slopes below the retaining wall and in adjacent riparian areas. Fennel plants are concentrated along the lower bank of the creek. They have been cut/controlled throughout 2008; yet fennel plants still occur in the project vicinity.

**Plant Survival.** The monitoring of the two *riparian mitigation sites* was conducted approximately nine months after the plantings were installed.



*Site #1 (Meridian Avenue).* During the October 2008 monitoring, 59 container stock planting sites were documented to contain live trees or shrubs, yielding a survival rate of 91%. Each tree species showed a greater than 80% survival rate; box elder, California buckeye and coast live oak showed 100% survival. Blue elderberry has 93% survival. Shrub plantings yielded a 100% survival rate for mugwort; however, holly-leaved cherry and California blackberry had rates of 50% and 88%, respectively. Plant survival of holly-leaved cherry does not meet the performance standard of 80%. Although not required to be counted, the plant survival of the willow and cottonwood cuttings is estimated at 60%.

Average plant heights ranged from 1.2 feet (California blackberry) to 3.5 feet (blue elderberry). Plant vigor and health ratings were all excellent (4.0). Table 4 displays the data collected from this mitigation site.

**Table 4. Year 1 (2008) Container Stock Plant Survival Data within Site #1 (Meridian Avenue)**

Plant Species	Number of Plants Installed (January 2008)	Number of Plants Alive (10/08)	Percent Survival in Year 1 (10/08)	Average Vigor/Health	Average Height (Feet)
<b>Trees</b>					
Box Elder	3	3	100%	4.0/4.0	2.4
California Buckeye	11	11	100%	4.0/4.0	1.6
Coast Live Oak	5	5	100%	4.0/4.0	1.7
Blue Elderberry	6	5	93%	4.0/4.0	3.5
Willow	20	- <sup>1</sup>	- <sup>1</sup>	-	2.4
Fremont Cottonwood	11	- <sup>1</sup>	- <sup>1</sup>	-	2.4
<b>Shrubs</b>					
Mugwort	8	8	100%	4.0/4.0	2.8
Holly-leaved Cherry	11	7	64%	4.0/4.0	1.8
California Blackberry	21	20	88%	4.0/4.0	1.2

<sup>1</sup> – plant survival count not required for these species; estimated at 60% based on field observations

*Site #2 (Auzerais Avenue).* The October monitoring found 70 container stock planting sites with live trees or shrubs, yielding an overall survival rate of 96%. Each tree species showed 100% survival rate. For the shrub, coyote brush had 100%. Holly-leaved cherry had the lowest survival rate of 63%; this rate does not meet the performance standard of 80%.

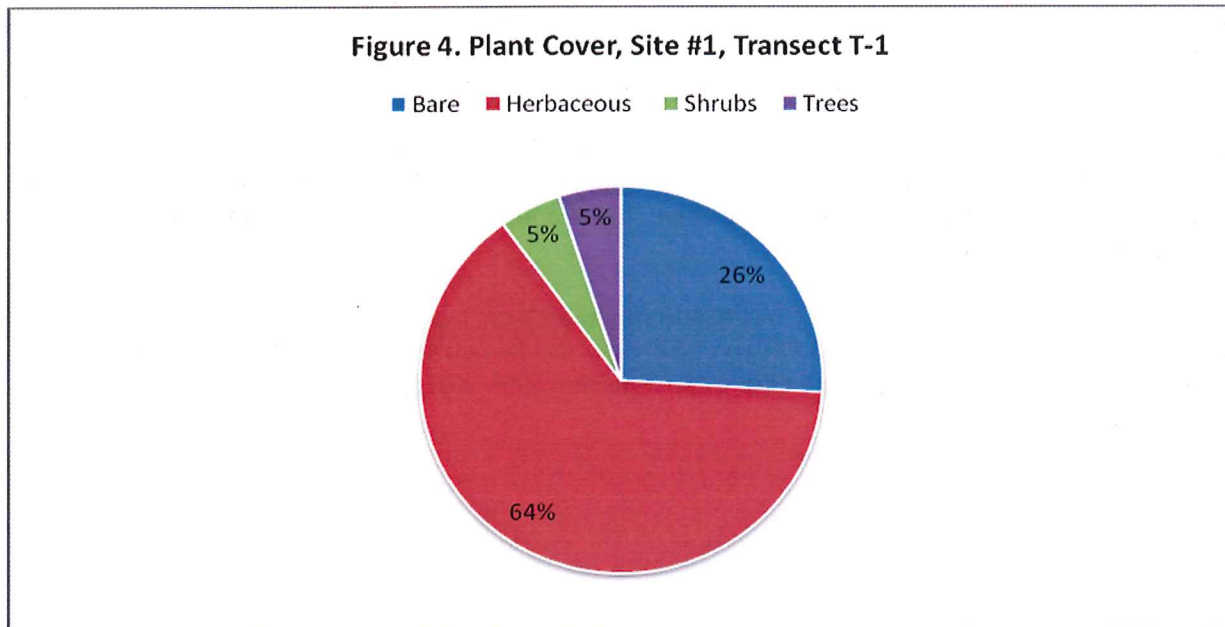
Average plant heights ranged from 1.1 feet (California blackberry) to 3.7 feet (box elder). Plant vigor and health ratings ranged from a low of 3.9 (very good vigor and health) for blue elderberry and box elder to 4.0 (excellent vigor and health) for all other plants species. Table 5 displays the data collected from this mitigation site.

**Table 5. Year 1 (2008) Container Stock Plant Survival Data within Site #2 (Auzerais Avenue)**

Plant Species	Number of Plants Installed (January 2008)	Number of Plants Alive (10/08)	Percent Survival in Year 1 (10/08)	Average Vigor/Health	Average Height (Feet)
<b>Trees</b>					
Box Elder	7	7	100%	3.9/3.9	3.7
California Buckeye	9	9	100%	4.0/4.0	2.3
Coast Live Oak	19	19	100%	4.0/4.0	2.7
Blue Elderberry	14	14	100%	3.9/3.9	2.5
<b>Shrubs</b>					
Coyote Brush	13	13	100%	4.0/4.0	3.1
Holly-leaved Cherry	11	8	63%	4.0/4.0	1.1
<b>Total</b>	<b>73</b>	<b>70</b>	<b>96%</b>	<b>-</b>	<b>-</b>

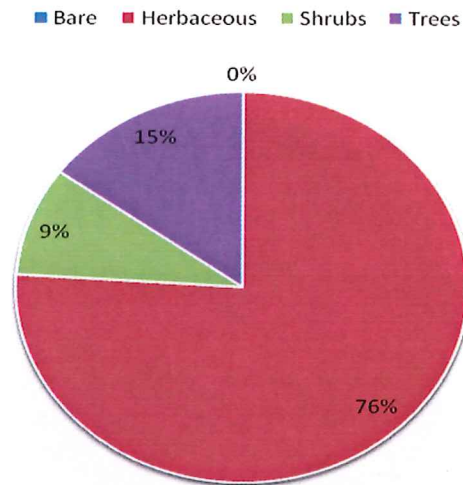
**Plant Cover.** Plant cover within the two *riparian mitigation sites* was documented along four transects (two transects per site). Point intercept sampling was conducted along a total of 115 meters, wherein plant cover was recorded at 1-meter intervals. The location of each transect is depicted on Figures 2 and 3. Due to a concern for vandalism of field stakes, the beginning point of each transect was selected at a permanent site feature (i.e., sign post, fence corner, etc.).

*Site #1 (Meridian Avenue).* The two transects at this site measure 32 meters (T-1, 216° heading) and 28 meters (T-2, 190° heading). Plant cover along transect T-1 was recorded at 74%. Tree cover was recorded at 5%, provided by California buckeye. Shrub cover totaled 5% and was provided by holly-leaved cherry; this data is presented in Figure 4.



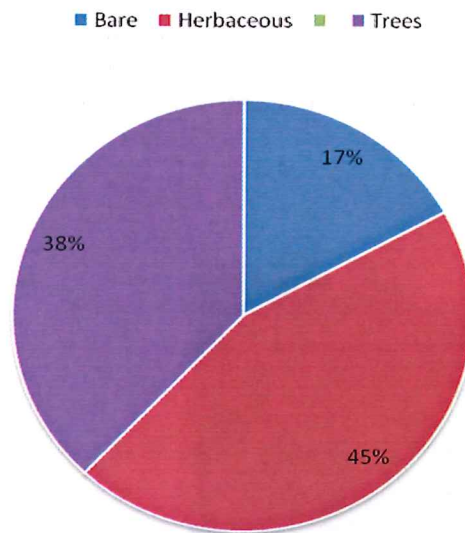
Plant cover along transect T-2 was recorded at 100%; with tree cover providing 15% cover (provided by California walnut, blue elderberry and coast live oak). Shrub cover totaled 9%, with cover provided by California blackberry and coyote brush. This data is presented in Figure 5.

**Figure 5. Plant Cover, Site #1, Transect T-2**



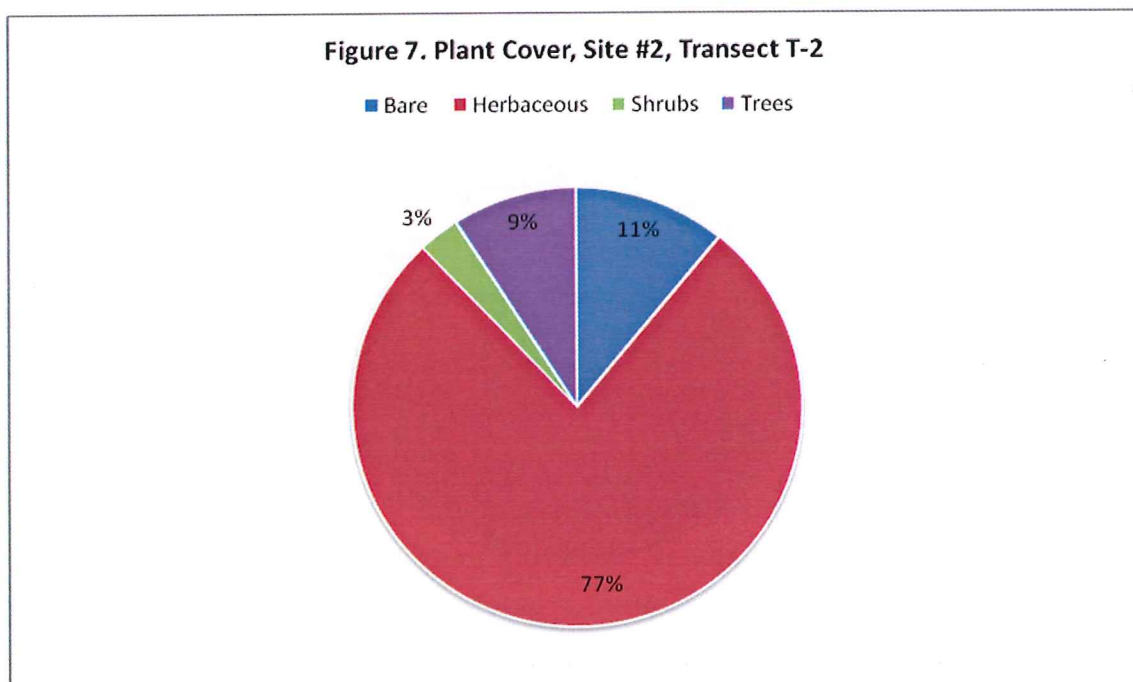
*Site #2 (Auzerais Avenue).* The two transects at this site measure 25 meters (T-1, 174° heading) and 30 meters (T-2, 122° heading). Plant cover along transect T-1 was recorded at 83%. Tree cover was recorded at 38% by coast live oak, willow (pre-existing mature trees) and blue elderberry. No shrubs provided cover along this transect, yet herbaceous cover (grasses) was 45%. Bare areas were covered by mulch. This data is presented in Figure 6.

**Figure 6. Plant Cover, Site #2, Transect T-1**



Plant cover along transect T-2 was recorded at 89%, with tree cover providing 9% cover (provided by coast live oak. Shrub cover totaled 3%, with cover provided by coyote brush. Herbaceous cover (provided by grasses) is 77%. This data is presented in Figure 7.





### Photo-Documentation

Two photo stations were established at each mitigation site. These photo stations are used to record the progress of the revegetation over time. The location of these stations is depicted on Figures 2 and 3.

**Site #1 (Meridian Avenue).** The Year 1 (2008) condition on Site #1 (Meridian Avenue) is depicted in Figures 8 through 11. Figures 8A and 8B depict the downstream plantings adjacent to the Los Gatos Creek Trail in January 2008 (immediately after installation) and in October 2008. Figure 8B also shows transect T-1.



Figure 8A. Photo station A, downstream portion of Site #1, showing plantings adjacent to trail, January 2008.



Figure 8B. Downstream portion of Site #1, showing plantings adjacent to trail, October 2008, location of Transect T-1 (heading 216°), (photo station A).

Figures 9A and 9B depict the upstream section in January 2008 and in October 2008. Figure 10 depicts the vegetation along transect T-2 in October 2008. Figure 11 shows a typical planting (box elder).



Figure 9A. Photo station B, upstream portion of Site #1, showing plantings down slope of retaining wall, April 2008.



Figure 9B. Upstream portion of Site #1, showing plantings down slope of retaining wall, October 2008 (photo station B).





Figure 10. Transect T-2 along slope, showing plantings along transect, (heading 190°), October 2008



Figure 11. Box elder plantings on creek bank, October 2008

**Site #2 (Auzerais Avenue).** The Year 1 (2008) condition on Site #2 (Auzerais Avenue) is depicted in Figures 12 through 17. Figures 12A and 12B depict the revegetation area looking toward Auzerais Avenue in January 2008 (immediately after installation) and in October 2008. This is photo station A

Figures 13A and 13B depict the upstream section in January 2008 and in October 2008. This is photo station B, looking toward Los Gatos Creek. Figures 14 and 15 depict transects T-1 and T-2, respectively. Figures 16 and 17 show the approximately one-year condition of two coast live oak tree plantings (October 2008).





Figure 12A. Photo station A, looking toward Auzerai Avenue, January 2008.



Figure 12B. Photo station A, looking toward Auzerai Avenue, October 2008.



Figure 13A. Photo station B, looking toward Los Gatos Creek, January 2008.



Figure 13B. Photo station B, looking toward Los Gatos Creek, October 2008.



Figure 14. Transect T-1, looking southward from Auzeris Avenue (heading 174°), October 2008.



Figure 15. Transect T-2, looking toward Los Gatos Creek (heading 122°), October 2008.





Figure 16. Coast live oak planting, October 2008.



Figure 17. Coast live oak planting, October 2008.

## CONCLUSIONS AND RECOMMENDATIONS

According to the mitigation plan for the project, the City is responsible for 80% survival (per species) for the container stock plantings. As per the data collected in October 2008 (Year 1), the site #1 (Meridian Avenue) plantings yielded an overall 96% survival rate; however, holly-leaved cherry was below the 80% survival requirement. Similarly, the site #2 (Auzerais Avenue) plantings yielded an overall 91% survival rate, but holly-leaved cherry was below the 80% survival requirement. Replacement plantings of holly-leaved cherry are needed for the project to meet the plant survival performance standard. The City's landscape contractor is responsible for providing 100% survival at the end of Year 1. Therefore, the following plantings are to be installed for all plantings to be at 100% survival:

Site #1: 3 holly-leaved cherry

Site #2: 4 holly-leaved cherry, 1 California blackberry, 1 blue elderberry

For Year 1, there are no plant cover performance standards other than the cover by invasive, non-native plant species. At all transects, cover by such species (i.e., ivy, fennel, others) was less than 5%. The project meets this performance standard.

## **RECOMMENDATIONS FOR YEAR 2 (2009)**

The maintenance and management program for the *Riparian Mitigation Sites* is to establish native riparian habitat that provides suitable and sustainable habitat for wildlife, and that will require little or no maintenance in the long term.

Starting in Year 2 (2009), the City of San Jose is responsible for implementing site maintenance. Please refer to the *Los Gatos Creek Trail Reach 4 Riparian Mitigation Maintenance Manual* for specific actions to be implemented to Year 2, including the schedule and techniques for supplemental irrigation, weed control, and removal/control of invasive, non-native plant species.

## **Maintenance and Management Actions Year 2 (2009)**

- Implement maintenance activities during the growing season (March to October), such that plant survival rates are maximized and desired habitat features are achieved, including irrigation, weeding, trash pick-up, and removal of invasive species.
- Implement maintenance activities during the dormant season (November to February) including weed control, repair of surface erosion (if noted).
- Implement remedial actions on a yearly basis if plantings or habitats fail to meet performance standards.

### Irrigation

- Irrigate container stock tree and shrub plantings (refill gel tubes at site #1 once a month, hand water plants at site #2 once a week). Monitor plants for any drought stress and increase watering if stress is noted.

### Weed Control

- Remove weeds from planting basins; basin shall be weed-free during the growing season; maximum weed height of 6 inches during non-growing season.
- During the growing season, twice a month, weed whip around plantings to reduce competition from other plants.
- Once a month remove/control invasive, non-native plant species within the mitigation areas (i.e., areas outside of planting basins, yet within mitigation area) to less than 5% cover. At site #1 species of management concern are fennel, English ivy, and thistles.

### Plant Protection

- Maintain plant protection cages around installed plants; cages protect plants from mechanical weeding (i.e., weed-whipping). Repair and/or replace screens that have been damaged.

### Replacement Plantings

- Replace dead plants within the riparian areas if plant survival rates falls below 80%.

### Monitoring

- Monitor the status of the *riparian mitigation areas* between April and October 2009.
- Conduct detailed monitoring of mitigation areas and prepare a monitoring report for submittal to CDFG and the City of San Jose Planning Department by December 31, 2009.